Ministry of
Northern Development
and Mines
Ontario

Ontario Geological Survey
Open File Report 5855

PETROCH Lithogeochemical Data

1993

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ONTARIO GEOLOGICAL SURVEY

Open File Report 5855

PETROCH Lithogeochemical Data

By

M. Haus and T. Pauk

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Ontario Geological Survey

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Forward

Rock chemical data are an important aid in assessing the mineral potential of Ontario. Data on rocks collected by geoscientists of the Ontario Geological Survey are not only published in geoscience reports, but since 1984 are also available on request from an in-house computerized database known as PETROCH. This rock chemical data is now presented in this Open File Report (OFR) which lists all public digital data as of August 1992. The data is formatted in an ASCII, comma and quote delimited file ready for import into any commercially available relational database. Each sample entry contains information on major and trace element concentrations, location and the description of the rock analyzed.

J. Wood

Director

Information Services Branch
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5 Data Diskettes, 5.25" high density, containing PETROCH ASCII files ..... back pocket

ABSTRACT

This Open File Report and the accompanying diskettes list 27,476 major oxide and trace element whole rock chemical analysis records of Ontario rocks from the PETROCH database. These samples, collected over fifteen years, have never been released to the public in its entirety.

The purpose of this report is to make this data accessible to geoscientists, mining industry professionals, prospectors and environmental scientists.

The data on the diskettes is in a comma and quote delimited ASCII format. To save space, data is compressed ("zipped") and can be imported into any commercially available relational database management system.

PETROCH LITHOGEOCHEMICAL DATA

by

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Open File Report

PETROCH LITHOGEOCHEMICAL DATA

I. Introduction

This Open File Report (OFR) describes the computer generated data retrieval of PETROCH into a comma and quote delimited ASCII format. The data retrieval was generated from the PETROCH lithogeochemical database maintained by the Data Services Section (DSS) of the Ontario Geological Survey (OGS). PETROCH contains computerized information on rock samples collected by staff geoscientists during field projects undertaken since the mid 1970's. This electronic database lists 27,476 samples for which chemical data were available as of August 1992.

The location and other descriptive information for a sample have been recorded by the geologist in charge of a given project. The major and trace element concentrations were determined by the Geoscience Laboratories of the OGS.

Information on applied analytical methods may be obtained by contacting the Chief Analyst (Acting), Geoscience Laboratories Section, Ontario Geological Survey, 933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5, telephone (705) 670-5643. Please quote the job number. Additional information on the samples and their geological setting may be obtained by consulting published OGS geoscience reports. These reports may be identified by using the NTS, Township and Author sections in the Index To Published Reports and Maps, Mines and Minerals Division (Miscellaneous Paper MP77 and its Supplements).

Efforts have been made to ensure the accuracy of the information contained in the PETROCH database, but the Ministry of Northern Development and Mines does not assume any liability for errors and omissions that may occur. Corrections and suggestions for improvement of this and future Open File Reports are welcomed.

II. Description of Data Items

The following comments on coding conventions should assist the user of this report.

The latitude and longitude of the recorded sample location are expressed in decimal degree values. It should be noted that identical co-ordinates may have been recorded for samples taken at one or a cluster of outcrops. The same also applies to samples taken underground in mine workings.

The UTM (Universal Transverse Mercator) values for zone, easting, and northing are usually calculated from latitude and longitude values, except in some cases where topographic maps were used as a reference map.

The basic NTS (National Topographic System) unit is the 7'30" latitude by 15' longitude quadrangle ie. 32K13SE, in which the sample is located.

The Area records the geographic Township, Indian Reserve or Block in which the sample was taken. If the sample location is outside the coverage of these entities, the name of the Area Claim Map is entered. A few samples were taken outside Ontario generally in Quebec or the USA. This is indicated by QUE or USA following the name of the geographic entity.

Field Rock Name is the name given to the rock specimen in the field.

The entity for Material is one of a closed list of values:

VOLC - volcanic
INTR - intrusive
SEDI - sedimentary
META - metamorphic
OTHER - other, ie. vein material

The Age entry indicates the broad geological time unit to which the collected sample belongs, ie.

for Precambrian rocks:

ARCH - Archean
PROT - Proterozoic
PREC - Precambrian

for Phanerozoic rocks:

QUAT - Quaternary
CRET - Cretaceous
SILU - Silurian
CAMB - Cambrian

Broader units are indicated if the stratigraphic position of a Phanerozoic rock has not been precisely determined, i.e. CENO (Cenozoic), MESO (Mesozoic) and PALE (Paleozoic).

The Stratigraphy data item was introduced in the late 1980's and hence only few samples have a value for this field. It may be used, without strict rules at the discretion of the project leader, to indicate named rock units, ie. NIPISSING diabase, MATINENDA formation.

The items Sample Description, Comments and References are optional, and entries, if any, are in a free format.

Major Oxide Values are expressed as percentages with two decimals. If a certain oxide has not been determined, the space for its value is left blank. "CO_2" refers to total carbon reported as CO_2. LOI stands for Loss of Ignition and SP GR for Specific Gravity.

Traces, when determined, are presented as one or more fields. If the quantity is negative, it indicates the detection limit, and the trace falls in the zero to detection limit interval.

Units refer to the trace element preceding the unit. Units are recorded as either "B" - Parts per billion
or "M" - Parts per million (default)
If there is a trace element recorded for a sample without a unit, "M" is understood. (When doing calculations, it may be necessary to convert PPM to PPB or vice versa. To convert:

PPB to PPM, divide PPB by 1000
PPM to PPB, multiply PPM by 1000

The Laboratory Comments field is used for recording of analytical comments and for reporting values of trace elements higher than expected.

Geologist name indicates the party leader responsible for the field project under which the sample was collected. The geologist is normally also the author or co-author of any publication(s) resulting from the project.

Job No. identifies the batch of analyses in which the sample was processed by the Geoscience Laboratories. The first two digits of the number indicate the year of this batch.

Field No. is the number assigned to the sample by the geologist. This reference is useful when examining publications by this geologist. The first two digits indicate the year of the sample collection.

III. Description of Files

File Format

The PETROCH data enclosed with this OFR is contained on five, 5 1/4" high density floppy diskettes. The data is in five comma and quote delimited ASCII files (one file per diskette) that have been compressed into the following self-extracting executable files.

Diskette #1	Northern.exe
Diskette #2	Western.exe
Diskette #3	Central.exe
Diskette #4	Abitibi.exe
Diskette #5	Southern.exe

These files and the data compression are explained in the following sections.

Geographic File Locations

The PETROCH database has been divided into five geographic locations defined by latitude and longitude boundaries. PETROCH was divided mainly to cut down on the enormous size of the database so it would be more manageable to use. The five geographic locations including the number of samples in each and the size of the files are as follows. See figure 1 for a map outline of the five geographic locations.

Northern.exe

Northern Ontario 50.75001 Lat - 57.00000 Lat
80.00001 Long - 96.00000 Long

Samples: 3,171
ASCII file size: 2,515,787 bytes

Western.exe

Western Ontario 47.00001 Lat - 50.75000 Lat
88.00001 Long - 96.00000 Long

Samples: 5,577
ASCII file size: 4,330,956 bytes

Central.exe

Central Ontario 47.00001 Lat - 50.75000 Lat
83.00001 Long - 88.00000 Long

Samples: 4,606
ASCII file size: 3,641,528 bytes

Abitibi.exe

Abitibi 47.00001 Lat - 50.75000 Lat
79.00000 Long - 83.00000 Long

Samples: 9,815
ASCII file size: 7,281,299 bytes

Ontario Map Outline

Figure 1: Location of the five data files in the PETROCH database.

Southern.exe

Southern Ontario 42.00000 Lat - 47.00000 Lat
74.00000 Long - 85.00000 Long

Samples: 4,307
ASCII file size: 3,142,149 bytes

Note: Once imported into a database software package, the files may need approximately one-third more disk space than the ASCII file sizes given here.

Record Structure

Each file has the same record structure with a total of 228 fields. These fields are listed in appendix A as are the length and type of each field. The order of the fields listed is the same as that of the fields contained in the ASCII files. There is one unique field in PETROCH which is called Fieldno and is a 10 digit character field. This is the same unique field for all five files.

Note: For importing the PETROCH data into a database software package, all field lengths in the database should be defined the same as the lengths listed. Using smaller fields will result in concatenation of the data and using larger fields will result in blank spaces being added to the end of the fields.

IV. Using Petroch Data

Since the PETROCH data files are in a compressed format, they must be copied to a hard drive and uncompressed before they can be used. To uncompress the data, follow the steps listed below.

1. Make a subdirectory on your hard drive for the PETROCH files.

2. Copy one or more .exe files to the subdirectory.

3. Move to the newly created subdirectory.

4. Uncompress a file by typing the filename without the extension.

   ie. northern

The compressed file will "explode" to the original size of the file before data compression, so make sure you have enough room on your hard drive for the files. The original file sizes were given with the file locations in the previous section.

For every file you copy to your hard drive and "explode", you will end up with two files, the compressed file which has the extension .exe and the uncompressed file which has the extension .txt. Delete the compressed file from your hard drive.

Once you have completed the four steps for one or more of the files, you are ready to import the data into your database software program. See your database manuals for instructions on importing data.

V. Data Validation

The PETROCH data has undergone a data validation/ verification process. The focus of this process was to identify suspect data. During the process, some of the obvious mistakes and inconsistencies were corrected, but mostly, the data was "flagged" as explained here.

Data Modifications

The following changes have been made to the PETROCH data.

Trace Element Values

For field number "88RPS-0075", the trace element field RB_03 has been changed from -80.000 to 80.000

Geologist's Names

The following geologist's names were changed to conform to the standard geologist naming format of lastname, space, first initial, and if relevant, space and second initial.

55 records - from "CAMPBELL R" to "CAMPBELL R W"

3 records - from "DRESSLER B" to "DRESSLER B O"

22 records - from "EASTON, RM" to "EASTON R M"

15 records - from "MEYN H.D." to "MEYN H D"

56 records - from "SANBORN-BARRIE M" to "SANBORN-BARRIE M M"

9 records - from "SIRAGUSA GM" to "SIRAGUSA G M"

125 records - from "A L CORTIS" to "CORTIS A L"

Major Oxide Values

Fourteen records were corrected where the fields were shifted to the right from the field SiO_2 to sp_gr.

Record Deletions

50 Records have been deleted as it is believed that they were entered into PETROCH accidently.

86 Records have been deleted as a result of the geographic division of PETROCH because they had no latitude and longitude co-ordinates. Since the database was divided into five geographic locations based on longitude and latitude, it was not possible to determine which file any of the 86 records belonged to.

Test Flags

Four fields have been added to the PETROCH database. These fields are one character in length and are used as flags to identify specific records. All four flags are in some way used to identify records that have either missing data or data within the record that may be incorrect. The flag fields are listed here as are the number of records that were flagged with each.

1) Posit_flag char 1 Flags -"S" suspicious - 154 records
"M" multiple - 2,303 records
"P" problematic - 2,805 records

2) Chem_flag char 1 Flags - "D" duplicates - 248 records
"T" totals - 2,619 records
"L" negative loi - 63 records
"I" incomplete - 1,059 records

3) Geol_flag char 1 Flags - have not been used

4) Trace_flag char 1 Flags - have not been used

These flags were used mostly in conjunction with the tests/changes listed below.

Of the 27,476 records, 18,622 records have not been flagged.

* The geol_flag and the trace_flag have not been used to date, but may be used in the future for further data testing. They can presently be used by individual PETROCH owners for personal use of the data.

Data Testing

The following tests have been run on the PETROCH data.

Geographic Co-ordinates

(S)

Records that had suspicious co-ordinates (latitude and longitude) were flagged "S" in the posit_flag field. These co-ordinates were most often the corner of the geologist's map sheet or may have been "unusual" co-ordinates (both latitude and longitude) such as latitude 48.00000 and longitude 80.00000.

(M)

When four to ten continuous records had the same latitude and longitude as each other, the posit_flag field was flagged "M". Many of these chemical analyses records represent mineral deposit studies where multiple samples were taken from pits, trenches, mines, etc.

(P)

When groups of 11 or more continuous samples had the same latitude and longitude as each other, the posit_flag field was flagged "P". These chemical analyses records are suspect as to their location co-ordinates.

Duplicate Record Chemistry

(D)

Records with duplicates (records that were analyzed twice by the lab and entered twice into PETROCH under different field numbers) were checked against the original for a difference in the chemical analyses. Where a difference of more than 10% in an oxide value was found between the duplicate and the original record, the field chem_flag was flagged with a "D" for duplicate in both the original and the duplicate record. (Duplicates were used in the OGS Laboratory as a method of quality control for sample analysis).

Chemistry Totals

(T)

Records where the field "total" was outside the range of 98% to 101% were flagged "T" in the chem_flag field. Some of the totals fell below 98% because only a partial chemical analysis was done on the corresponding samples.

Negative Loi

(L)

Records that displayed negative loi's were flagged "L" in the chem_flag field.

Incomplete Chemistry

(I)
Records that were without either both H_2O plus and H_2O minus or loi were flagged "I" in the chem_flag field.

** Note: Many other tests were run on PETROCH, mostly on the major oxide values. The tests were inconclusive except to say that the procedures used in the lab to analyze the data may have varied over the years since PETROCH was first established.

VII. Summary

PETROCH is a collection of 27,476 rock samples collected and analyzed by the OGS. PETROCH contains information on each sample such as the location where it was found, description of the sample, and the chemical analysis performed by the OGS Laboratory.

The purpose of this report is to make the PETROCH data available in an electronic PC compatible format to both Ministry employees and to the public.

Attempts have been made by the OGS to validate/verify the PETROCH data in order to improve the quality of the data.

Enclosed in this OFR is 5, 5 1/4" high density floppy diskettes containing the PETROCH data in five comma and quote delimited ASCII files.

References

Ontario Geological Survey: Processing of Rock Chemical DData, User's Guide, 1986 Revision, 63 pages, 2 tables, 8 appendices.

Ontario Geological Survey: Rock Chemical Data Calalogue, Open File Report 5570, 8 pages, 2 figures, 1 table, and 22 microfiche in back pocket.

APPENDIX A

RECORD STRUCTURE

Record Structure

	Field Name	Type	Width	Dec	Full Field Name
1	JOBID	CHARACTER	8		Job Identification
2	PROJNO	CHARACTER	6		Project Number
3	PROJID	CHARACTER	2		Project Identification
4	GEOLOGIST	CHARACTER	20		Geologist
5	DATE	CHARACTER	8		Date
* 6	FIELDNO	CHARACTER	10		Field Number
7	LATITUDE	NUMERIC	8	5	Latitude
8	LONGITUDE	NUMERIC	9	5	Longitude
9	UTM_ZONE	CHARACTER	3		UTM Zone
10	UTM_EAST	NUMERIC	6		Easting
11	UTM_NORTH	NUMERIC	7		Northing
12	AREA_TWP	CHARACTER	30		Area / Township
13	DEPTH	CHARACTER	6		Depth
14	POSIT_FLAG	CHARACTER	1		Position Flag
15	NTS	CHARACTER	8		National Topigraphic System
16	ROCK_NAME	CHARACTER	25		Rock Name
17	MATERIAL	CHARACTER	5		Material
18	AGE	CHARACTER	4		Age
19	STRATIGRAP	CHARACTER	15		Stratigraphy
20	DES_CM_REF	CHARACTER	72		Description, Comments, References
21	GEOL_FLAG	CHARACTER	1		Geology Flag
22	SIO2	NUMERIC	5	2	
23	AL2O3	NUMERIC	5	2	** Fields 22 - 36
24	FE2O3	NUMERIC	5	2	are Major Oxides
25	FEO	NUMERIC	5	2	
26	MGO	NUMERIC	5	2	
27	CAO	NUMERIC	5	2	
28	NA2O	NUMERIC	5	2	
29	K2O	NUMERIC	5	2	
30	TIO2	NUMERIC	5	2	
31	P2O5	NUMERIC	4	2	
32	MNO	NUMERIC	4	2	
33	CO2	NUMERIC	5	2	
34	S	NUMERIC	5	2	
35	H2O_PLUS	NUMERIC	5	2	
36	H2O_MINUS	NUMERIC	4	2	
37	LOI	NUMERIC	4	1	Loss on Ignition
38	TOTAL	NUMERIC	6	2	
39	SP_GR	NUMERIC	4	2	Specific Gravity
40	CHEM_FLAG	CHARACTER	1		Chemistry Flag
41	AG_01	NUMERIC	8	3	
42	AG_01_U	CHARACTER	1		
43	AS_01	NUMERIC	8	3	** Odd number fields 41 -
44	AS_01_U	CHARACTER	1		225 are trace elements
45	AU_01	NUMERIC	8	3	

* Unique Field

46	AU_01_U	CHARACTER	1		** Even number fields 42
47	BA_01	NUMERIC	8	3	226 are trace element units
48	BA_01_U	CHARACTER	1		
49	BI_01	NUMERIC	8	3	
50	BI_01_U	CHARACTER	1		
51	CO_01	NUMERIC	8	3	
52	CO_01_U	CHARACTER	1		
53	CR_01	NUMERIC	8	3	
54	CR_01_U	CHARACTER	1		
55	CU_01	NUMERIC	8	3	
56	CU_01_U	CHARACTER	1		
57	LI_01	NUMERIC	8	3	
58	LI_01_U	CHARACTER	1		
59	NI_01	NUMERIC	8	3	
60	NI_01_U	CHARACTER	1		
61	PB_01	NUMERIC	8	3	
62	PB_01_U	CHARACTER	1		
63	SB_01	NUMERIC	8	3	
64	SB_01_U	CHARACTER	1		
65	ZN_01	NUMERIC	8	3	
66	ZN_01_U	CHARACTER	1		
67	B_02	NUMERIC	8	3	
68	B_02_U	CHARACTER	1		
69	BE_02	NUMERIC	8	3	
70	BE_02_U	CHARACTER	1		
71	CO_02	NUMERIC	8	3	
72	CO_02_U	CHARACTER	1		
73	CU_02	NUMERIC	8	3	
74	CU_02_U	CHARACTER	1		
75	MO_02	NUMERIC	8	3	
76	MO_02_U	CHARACTER	1		
77	NI_02	NUMERIC	8	3	
78	NI_02_U	CHARACTER	1		
79	SC_02	NUMERIC	8	3	
80	SC_02_U	CHARACTER	1		
81	SR_02	NUMERIC	8	3	
82	SR_02_U	CHARACTER	1		
83	V_02	NUMERIC	8	3	
84	V_02_U	CHARACTER	1		
85	W_02	NUMERIC	8	3	
86	W_02_U	CHARACTER	1		
87	Y_02	NUMERIC	8	3	
88	Y_02_U	CHARACTER	1		
89	CS_03	NUMERIC	8	3	
90	CS_03_U	CHARACTER	1		
91	GA_03	NUMERIC	8	3	
92	GA_03_U	CHARACTER	1		
93	NB_03	NUMERIC	8	3	
94	NB_03_U	CHARACTER	1		
95	RB_03	NUMERIC	8	3	
96	RB_03_U	CHARACTER	1		

97	SR_03	NUMERIC	8	3
98	SR_03_U	CHARACTER	1	
99	Y_03	NUMERIC	8	3
100	Y_03_U	CHARACTER	1	
101	ZR_03	NUMERIC	8	3
102	ZR_03_U	CHARACTER	1	
103	TA_03	NUMERIC	8	3
104	TA_03_U	CHARACTER	1	
105	TH_03	NUMERIC	8	3
106	TH_03_U	CHARACTER	1	
107	CR_03	NUMERIC	8	3
108	CR_03_U	CHARACTER	1	
109	SN_03	NUMERIC	8	3
110	SN_03_U	CHARACTER	1	
111	BA_03	NUMERIC	8	3
112	BA_03_U	CHARACTER	1	
113	PR_04	NUMERIC	8	3
114	PR_04_U	CHARACTER	1	
115	SM_04	NUMERIC	8	3
116	SM_04_U	CHARACTER	1	
117	EU_04	NUMERIC	8	3
118	EU_04_U	CHARACTER	1	
119	GD_04	NUMERIC	8	3
120	GD_04_U	CHARACTER	1	
121	TB_04	NUMERIC	8	3
122	TB_04_U	CHARACTER	1	
123	DY_04	NUMERIC	8	3
124	DY_04_U	CHARACTER	1	
125	HO_04	NUMERIC	8	3
126	HO_04_U	CHARACTER	1	
127	ER_04	NUMERIC	8	3
128	ER_04_U	CHARACTER	1	
129	TM_04	NUMERIC	8	3
130	TM_04_U	CHARACTER	1	
131	YB_04	NUMERIC	8	3
132	YB_04_U	CHARACTER	1	
133	LU_04	NUMERIC	8	3
134	LU_04_U	CHARACTER	1	
135	BR_05	NUMERIC	8	3
136	BR_05_U	CHARACTER	1	
137	CL_05	NUMERIC	8	3
138	CL_05_U	CHARACTER	1	
139	F_05	NUMERIC	8	3
140	F_05_U	CHARACTER	1	
141	I_05	NUMERIC	8	3
142	I_05_U	CHARACTER	1	
143	HG_05	NUMERIC	8	3
144	HG_05_U	CHARACTER	1	
145	U_05	NUMERIC	8	3
146	U_05_U	CHARACTER	1	
147	CD_05	NUMERIC	8	3
148	CD_05_U	CHARACTER	1	

149	MO_05	NUMERIC	8	3
150	MO_05_U	CHARACTER	1	
151	SN_05	NUMERIC	8	3
152	SN_05_U	CHARACTER	1	
153	SE_05	NUMERIC	8	3
154	SE_05_U	CHARACTER	1	
155	TE_05	NUMERIC	8	3
156	TE_05_U	CHARACTER	1	
157	GE_05	NUMERIC	8	3
158	GE_05_U	CHARACTER	1	
159	AU_06	NUMERIC	8	3
160	AU_06_U	CHARACTER	1	
161	PT_06	NUMERIC	8	3
162	PT_06_U	CHARACTER	1	
163	PD_06	NUMERIC	8	3
164	PD_06_U	CHARACTER	1	
165	RU_06	NUMERIC	8	3
166	RU_06_U	CHARACTER	1	
167	RH_06	NUMERIC	8	3
168	RH_06_U	CHARACTER	1	
169	OS_06	NUMERIC	8	3
170	OS_06_U	CHARACTER	1	
171	IR_06	NUMERIC	8	3
172	IR_06_U	CHARACTER	1	
173	RE_06	NUMERIC	8	3
174	RE_06_U	CHARACTER	1	
175	IN_06	NUMERIC	8	3
176	IN_06_U	CHARACTER	1	
177	SI_07	NUMERIC	8	3
178	SI_07_U	CHARACTER	1	
179	AL_07	NUMERIC	8	3
180	AL_07_U	CHARACTER	1	
181	FE_07	NUMERIC	8	3
182	FE_07_U	CHARACTER	1	
183	CA_07	NUMERIC	8	3
184	CA_07_U	CHARACTER	1	
185	MG_07	NUMERIC	8	3
186	MG_07_U	CHARACTER	1	
187	NA_07	NUMERIC	8	3
188	NA_07_U	CHARACTER	1	
189	K_07	NUMERIC	8	3
190	K_07_U	CHARACTER	1	
191	P_07	NUMERIC	8	3
192	P_07_U	CHARACTER	1	
193	TI_07	NUMERIC	8	3
194	TI_07_U	CHARACTER	1	
195	MN_07	NUMERIC	8	3
196	MN_07_U	CHARACTER	1	
197	C_07	NUMERIC	8	3
198	C_07_U	CHARACTER	1	
199	S_07	NUMERIC	8	3
200	S_07_U	CHARACTER	1	

201	PB_08	NUMERIC	8	3	
202	PB_08_U	CHARACTER	1		
203	TH_08	NUMERIC	8	3	
204	TH_08_U	CHARACTER	1		
205	U_08	NUMERIC	8	3	
206	U_08_U	CHARACTER	1		
207	HG_08	NUMERIC	8	3	
208	HG_08_U	CHARACTER	1		
209	TL_08	NUMERIC	8	3	
210	TL_08_U	CHARACTER	1		
211	SN_08	NUMERIC	8	3	
212	SN_08_U	CHARACTER	1		
213	CE_08	NUMERIC	8	3	
214	CE_08_U	CHARACTER	1		
215	LA_08	NUMERIC	8	3	
216	LA_08_U	CHARACTER	1		
217	ND_08	NUMERIC	8	3	
218	ND_08_U	CHARACTER	1		
219	Y_08	NUMERIC	8	3	
220	Y_08_U	CHARACTER	1		
221	W_08	NUMERIC	8	3	
222	W_08_U	CHARACTER	1		
223	MO_08	NUMERIC	8	3	
224	MO_08_U	CHARACTER	1		
225	SC_08	NUMERIC	8	3	
226	SC_08_U	CHARACTER	1		
227	LAB_COMNTS	CHARACTER	68		Lab Comments
228	TRACE_FLAG	CHARACTER	1		Trace Flag

*** Note: For numeric fields with decimal places, the width is the total number of digits, including the decimal places, but not the decimal point. The decimal is the number of decimal places, but not the decimal point.

CONVERSION FACTORS FOR MEASUREMENTS IN ONTARIO GEOLOGICAL SURVEY PUBLICATIONS

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
		LENGTH			
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709 7	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
		AREA			
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
		VOLUME			
1 cm^3	0.061 02	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.308 0	cubic yards	1 cubic yard	0.764 555	m^3
		CAPACITY			
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
		MASS			
1 g	0.035 273 96	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 75	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 62	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 908 8**	t
		CONCENTRATION			
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.